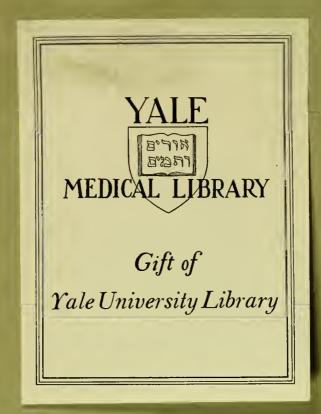


International medical congress, 1909.

A new method of intestional anastomosis.

1909

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XVITH INTERNATIONAL MEDICAL CONGRESS

BUDAPEST: AUGUST-SEPTEMBER 1909

SECTION VII: SURGERY

A new method of intestinal anastomosis

New instrument for direct transfusion of blood and temporary anastomosis between blood vessels --

Ether anesthesia by compressed air 🗸

BY

A. L. SORESI M. D. NEW-YORK



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A NEW METHOD OF INTESTINAL ANASTOMOSIS

The secret of succes of an intestinal anastomosis depends on bringing in contact large serous surfaces so that by inflammation intimate adhesions are formed.

The ideal method of making an anastomosis is the one wich reastablishes the continuity of the intestinal canal in its natural physiological axis.

Many difficulties are presented to the surgeon in making end to end anastomosis.

The intestine is entirely surrounded by peritoneum excepting where the mesentery by dividing in two leaves, forms a triangular space where there are no serous surfaces. It is difficult to close this space in such a way as to bring serous surfaces in contact and so avoid leakage of intestinal content, the consequences of wich you all know how serious they are. Another difficulty wich often presents itself is that the surgeon has to deal with two segments of intestine of different calibre, a condition wich compels him to resort to artifices wich render the operation more difficult, more dangerons and requiring more time.

To obviate these difficulties the surgeon has devised an ingenious plan: the lateral anastomosis. Here, no difficulties in approximating large serous surfaces; the calibre of the intestine is of no importance, and the results obtained by this method in comparaison with those of the end to end anastomosis, have made the lateral the operation of choice. Allow me to consider briefly the tecnique and final results of the lateral anastomosis.

The lateral anastomosis is, in fact, a triple operation: that is, it is necessary to close the two segments of the resected gut (two distint operative procedures) before accomplishing the third; the anastomosis. The entire operation is lengthy and the danger incurred either from faulty tecnique or infection are three fold.

It may be argued that statistics prove that the results of the operation are very satisfactory, but we must keep in mind that these statistics are based on the results obtained by the very best surgeons whose ability and surrounding enable them to be successful with almost any method. If we could obtain the results of surgeons and practitioners who have neither the training nor the opportunity for doing much intestinal work, statistics would be not so favorable.

Let us not forget that even the best surgical ability can not eliminate and at times not even lessen the faulty conditions created by the operation. It is only necessary to remember that the formation of two culs-de-sac is absolutely foreing to normal physiological conditions. Only to often the anastomotic opening narrows producing all the disagreable simptoms yon know, until another operation is necessary in order to avoid the danger of a complete occlusion. In emergency cases and in unfarovable conditions, it is often difficult to recognize the direction of the intestine.

There is not then the least doubt, that the ideal anastomosis is the one wich reproduces the natural conditions, by uniting the gut maintaining the straigh longitudinal direction whitout any obstacle.

It is not my purpose here to present to you the history of all the methods conceived to make end to end anastomosis easy, safe and rapid, you, eminent surgeons, know them better than I, and as you know their faults very often you choose the lateral method.

I ask your indulgence in giving your attention to the method I am presenting, the aim of wich is to give either to surgeons who are familiar with all the secrets and pitfalls of abdominal surgery and operate under the best of conditions; to practitioners who in emergency cases alone or assisted by collegues not having a good surgical training, are compelled to operate; or to military surgeons operating on the battlefield under the most unfavorable circomstances; a procedure wich, in my experience, is the most rapid, safe, and easy method of uniting two segments of gut.

The method has been demonstrated in about 200 cases at the Surgical Research Laboratory of the Columbia University of New York.

Dr. A. S. Sullivan has been my intelligent and invaluable assistant in these operations, and it gives me the greatest pleasure to express my sincere gratitude for his efficient cooperation.

With this method the intestinal suture is accomplished over a rubber tube of about 2 cm. in length. In the middle of the tube a circumferential stitch going trough the entire thickness of the tube, is passed about 2 mm. apart, forming thereby a series of loops on the external periphery. The two ends protruding externally will be left long. Fig. I.

Having prepared the field of operation in the usual manner, we will proceed as shwon in Fig. II and III.

For convenience in demonstration, the operation will be divided into three stages.

I Reunion of the two segments of gut at the mesenterie angles.

As shown in Fig. II a Connell mattress stitch in used. The Connell stitch is commenced and finished in the inside of the gut, where the two

Ends of calgut loops,

undangualing the state of the stat

Fig. I. - Tube with catgut loops.

ends are knotted and left long. The end not armed with a needle is held whit an artery forceps to be used later. Of course attention must be paid not to wound any blood vessel while going through the mesentery with the needle.

II. Continous mattress suture.

(As shown in Fig. 1 and II the thread of the Connell stitch going from one segment of the intestine to the other, must pass twice through a

catgut loop,)

The needle with the silk used in the Connell stitch is passed from within outward, close to the mesenteric angle. The two segments of the intestine are brought over the rubber tube and held in place by a temporary stitch. The catgut loops will then stand prominently betwen the two cut edges. The needle is passed under a ca gut loop. Close to the mesenteric angle of the apposite segment of gut a continuous mattres stitch is begun, wich as it passes back and forth goes through the catgut loops. The serosa is inverted with each stitch, by tucking it under with a forceps, and traction is maintained so that each stitch is kept taut. When the mattress sticth is com-

pleted, the silk will be knotted to the end wich was held by an artery forceps and the ends cut close to the knot.

In my experience I found it absolutely of no importance, whether the end of silk, wich in the Isl step of the operation, was left held by an artery forceps, is knotted to the end of silk wich was used as a continous mattress suture as it is, or is passed from the inside to the outside of the gut.

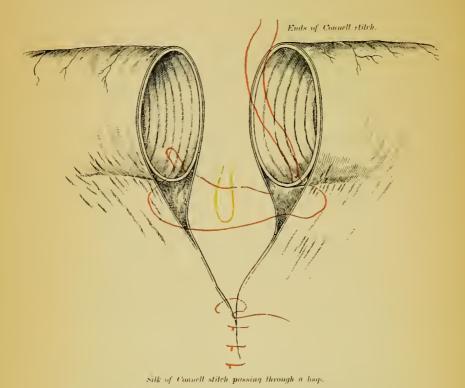


Fig. II. – Mesenteric angles secured by a Connell mattres stitch.

1st step of anastomosis.

It is immaterial whether the mattress suture takes in only the muscularis, as shown in Fig. IV, or is passed through the entire thickness of the gut. There is absolutely no danger by traversing the lumen of the gut, as will be demonstrated later.

One need not to be particular as to the regularity of the mattress stitch: the only important points are: to pass the silk under a catgut loop when going from one segment to the other and to invert the serosa with each stitch, keeping the silk taut.

III. Traction on the loose strands of catgut.

After the usual toilet, the two ends of the catgut, while holding the intestine in one hand, will be pulled one after the other until all the catgut loops are obliterated. The two ends of catgut are tied and cut. The anastomosis is complete: there is no need and it would be dangerous to use reeinfor-

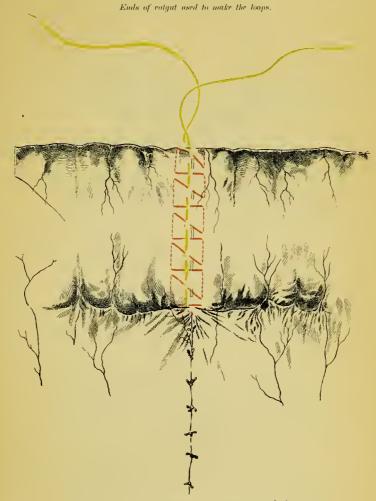


Fig. III. — Continous mattress stitch. 2^{d} step of anastomose.

cing or protecting stitches whatsoewer. The intestine is replaced in the abdominal cavity.

By examming Fig. 4 and 5 the value and simplicity of the method will be easily understood.

It is seen that as the intestine is mounted on the rubber tube and substained by the same, it is easy to pass the continous mattress stitch.

By keeping the stitch taut and tucking in the serosa a considerable inversion of the same is already obtained.

When the mattress suture is finished and the silk tied, it will be seen

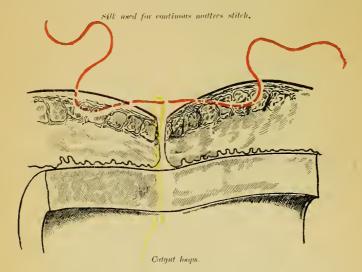


Fig. IV. — Intestin over rubber tube: before tying mattress suture and obliterating the loops.

that by obliterating the catgut loops, the silk will be brough down carrying with it the serous surfaces and burying everything that came in contact with the intestinal cavity, under so large a surface of serosa, that the union between

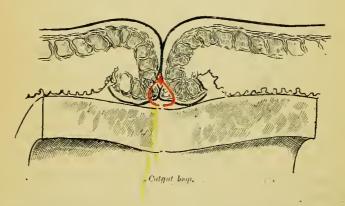


Fig. V. — Inversion of serous surfaces after the mattress stitch is knotted and the loops are obliterated — 3d step of anastomosis.

the surfaces in contact will be so close, as to avoid any probability of leakage. The same phenomenum obviously takes place all along the suture line and the terrible and dangerous mesenteric angle is as completely secured as any other portion of the gut.

Everything: catgut, silk, knot, tube; is in the inside of the intestine buried under a large portion of serous surfaces. Fig. V.

Should anyone object that I introduce a foreign body in the intestine. I immediately will a swer that the physiological fonction of the intest na canal is to have foreing hodies in it and that a piece of rubber adapting itself to every condition, and which in toto is smaller that an ordinary fecal mass, can not be considered anything neither dangerons nor even cumbersome.

Again, with any method, we introduce at least some silk wich remains in the intestine a much longer time than the tube, catgut, and silk used in the method.

It is obvious that when uniting two segments of intestine of different calibre, the mattress stitch should take a larger bite on the larger segment.

I have never experienced, and I believe it is impossible to have, any stenosis even by making the continous mattress stitch irregulary. I explain this fact in this way: the rubber tube wich is elastic being compressed by the inverted cut edges (See fig. V) exercices a gentle and continous pressure on the suture line, facilitating the formation of adhesion between the serous surfaces at their extremity of contact.

In my numerous experiments, the tube has been expulsed in from 60 to 90 hours. A very interesting point is, that as this time is insufficient to complete the digestion of the catgut, the tube carries out both catgut and silk suture with it, leaving absolutely no foreing material behind; and what little slough results from the operation is carried out with the stitches; after few days the suture line is as smooth as shown in fig. XI and no foreing body in left in the abdomen.

The advantages of the method are apparent.

Great rapidity, my best record being complete anastomosis in 4 minutes but as average the time required is from 5 to 7 minutes.

It can be considered that it is as safe against lekeage of intestinal content at the dreaded mesenteric angle as it is in any other point of the anastomosis.

It is very easy, even 2^d year students have successfully made several anastomos's.

There is absolutely no stenosis along the suture line, even using a very small tube, and time seems to improve the anastomosis as will be shown by numerous specimens dating several months.

It precludes the necessity of making lateral anastomosis in many cases. It obviate the necessity of being compelled to use mechanical devices, when the condition of the patient requires a quick operation: the anastamosis

made by mechanical devices being neither more rapid nor as safe, and they being not always at hand.

The adhesions betwen serous surfaces take place without the danger of a too rapid sloughing as often happens by using mechanical devices, and without the interposition of any foreing body wich causes adhesions betwen intestinal loops, mesentery, epiploon, etc., as at times happens with the silk used in the Lambert suture.

No foreing body, not even silk, is in the abdomen few hours after the operation.

The elasticity of the rubber tube prevents the kinging of the intestine along the suture line, and helps the peristalsis.

Gas and feces passe freely through the tube, the diameter of wich is almost equal to that of the intestin.

Even in cases where six anastomosis were made at one sitting, at the autospy there were no adhesions between the different abdominal organs.

And finally an anastomosis betwen segments of gut of different calibre is as easy, rapid and safe as one betwen segments of the same size.

In about 200 anastomosis made with the method I had only two insuccesses due to the fact, that at the beginning I was triving several means of insuring the mesenteric angles and some of them were not suitable.

I beg to reproduce some specimens: they represent the most tipical operations.

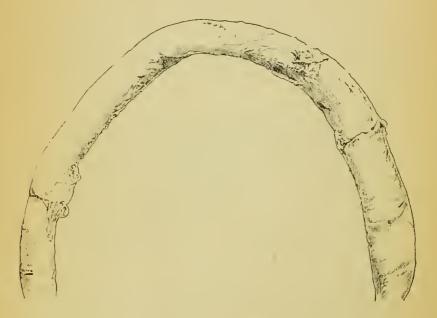


Fig. IV. - Three anastomosis.

Fig. VI. Dog operated January 23^d: 3 and stomosis in the jejunum. Tubes passed 70 hours after the operation. Dog fed after third day with common food: doing very well: killed May 3^d. Peritoneal cavity normal, little adhesions between epiploon and central anostomosis with has been made by a 2^d year student. It will be seen that although only few cm. apart the anastomosis did not cause any narrowing of the gut.

Fig. VII. March 15th at 9 a. m. Dr. Sul ivan produced an artificial hernia by costrincting in a small h le through the peritoneum and rectus muscle a loop of ileum. Dog vomited several times during the day at 10

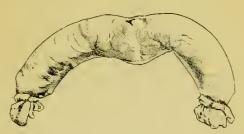


Fig. VII. — Anastomosis after resection of gut for strangleted hernia.

p. m. pulse feeble, frequent; oedema around the wound wich was reopened showing a blackish intestinal loop, and inflamation of the peritoneum. Resection of the loop; anastomosis: dog killed 87 days ofter operation. Peritoneal cavity in perfect conditions, some adhesions between epiploon and parietal peritoneum.

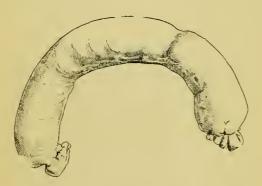


Fig. VIII. - Anastomosis with a very small tube.

Fig. VIII. The specimen shows the result obtained by making the anastomosis over a very small tube: that is, a tube abouth two thirds

smaller than the intestine: dog killed 57 days after operation: calibre of the gut almost normal.

Fig, IX Resection of cul de-sac of ileum with appendix and about 3 cm. of colon. Anastomosis between ileum and colon: tube passed 68 hours



Fig. IX. — Anastomosis between ileum and colon.

after operation: dog in the best of health killed 38 days after. Abdominal cavity normal: no adhesions.

To compare my method with the open anastomosis I beg you to examine the following specimens. Fig. X and XI.

A dog of good size has been chosen: Dr. Sullivan made an anastomosis betwen two segments of jejunum with the open method: and I made another one betwen two segments of colon full of feces at about 6 cm. from the anus. The tube has been passed 64 hours after, and the dog, wich was doing well, killed 5 days after the operation. With my method, the mulosa is already almost normal and although the colon was full of feces there were no complications and 64 hours after the operation no foreing body was left in the abdomen: the other anastomosis shows that the mucosa has to slough off with the silk still in place: but it is of no use telling you what you will see at first glance.

To demonstrate in a better way the results obtained with my method I will submit to your inspection a living dog on wich in June I made 6 anastomosis in the ileum at a distance of about 5 cm. from one another — another dog with 4 anastomosis made in May — another with an anastomosis betwen ileum and colon and to offer you the opportunity of judging the results obtained after a considerable length of time I will present you two of the first dogs I operated with the method on Ianuary. Also I will present to you a number of dog operated on at intervals from I to 8 days. All these dogs will be etherized and their abdominal cavity opened before you. A series of microscopical preparations, wich owing to illness I have been unable to reproduce in this paper, and many specimens including the ones reproduced here, will complete the practical demonstration of my method.

I dare to hope that showing to you, men the most prominent in the surgical profession, the practical and veracious results obtained. I have

done my best in order to submit to your judgment the method wich I am presenting to the Congress.

It must be noted that the degs have never been in anyway prepared for the operation: very often they have been operated only few hours after having been brought in from the street, someones extenuated and hungry;

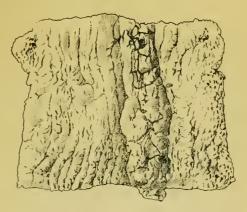


Fig. X. - Anastomosis with open method (jejunum).

some others overload d with the worse food: very often worms were found in the intestine.

All the dogs were fed the third day after the operation with common food. Some points of detail to be borne in mind are the following:

The best tube is one having a diameter about 113 less than the diameter of the intestinal lumen. In case of emergency, having but two tubes

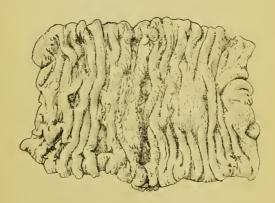


Fig. XI. - Anastomosis with Soresi's method (colon).

one very large and one small, I would advice to prefer the latter. Any rubber tubing is good, the best is black resilient rubber not to tihck. I have used old drainage tubes; tubes cut from the tubing of fountain siringes, etc. The tube can be prepared before the operation and it is better to use a round needle wich does not cut the rubber.

Plain catgut No. I has generally been used but in case of emergeny any suture material may be substituted. Catgut has been preferred because the loops stand ont prominently between the cut edges even when wet; then sliding witwout cutting the rubber.

When preparing the tube attention is called to the fact that the catgut ends should emerge at a distance of about 2 or 3 mm., so that when they are tied, a loop is formed.

I am informed at the last moment that the method has been tried successfully by Dr. Sullivan on a lady patient, who a year previously had a lateral anostomosis on the ileum performed with a Murphy button. The button did not pass and was found in the distal portion of the anastomosis, the opening betwen the segments of the gut was so narrowed that a new anastomosis was necessary. The patient was in such a poor condition that a rapid operation was required: my method has been used and as far as. I know the patient was doing well. Another patient was to be operated when I published this paper. I will refer of both verbally.

NEW INSTRUMENT FOR DIRECT TRANSFUSION OF BLOOD AND TEMPORARY ANASTOMOSIS BETWEN BLOOD VESSELS.

The direct transfusion of blood from the artery of a person to the vein of another is considered again as the most valuable therapeutic mean of preventing death from very severe hemorrhagies.

I have imagined and found very useful for direct transfusion the instrument wich I am presenting.

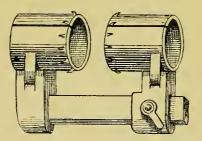


Fig. I. - Instrument complete.

It is composed of two small metal cylinders with can be put and held together by means of a small bar and a screw. Fig. I. Each cylinder can be opened by a simple pivot, and at one end, a little below the edge, is

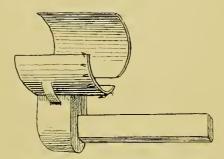


Fig. II. - Cylinder opened to receive blood ressel.

encircled by a crown of small hoocks, the points of wich are turned towards the other end. The illustrations will give an idea of the instrument better than any description.

To make the procedure clear, the operation will be divided in 3 stages. I. stage. Isolating thee blood vessels.

After having, in the usual manner isolated the blood vessels, a spatula, a flat rectactor, some rubber tissue, etc, will be passed under them, in order of preventing the hoocks to catch the tissues around the wound.

II stage. Placing the cilinders and inverting the blood vessels over the hoocks.

Take one of the cylinders open: Fig. II the blood vessel is inserted in it and the cylinder closed. The assistant, will exercice a little pressure on the blood vessel on the side whence the blood is running in order of preventing the internal pressure from overdistending its valls. With a pointed forceps the vessel will be invaginated over the hooks Fig. III.

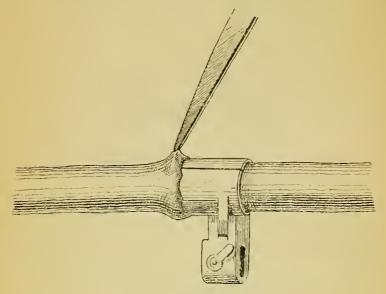


Fig. III. - Blood ressel inverted over cylinder.

III stage. Opening of the blood vessels and anastomosis.

When both vein an lartery are invaginated over the cylinders; while the assistant squeezes them with his hands, they will be cut with a sharp knife close to the edge of the cilinders, and rapidly these latters will be put together and the screw tied. Fig. IV. The blood will run freely from the artery to the vein. In case of lack of assistant two forceps covered with rubber can be substituted.

It will be seen that by cutting the blocd vessels close to the edge of the cylinders, the intima will be inverted. In case that some of the hooks should not hold well the blood wessels, so that the intima is not well inverted, this will be easily and quickly accomplished with the forceps, used before. Of course the other two segments of the artery and the vein will be secured by a forceps ad tied. Fig. IV shows the two blood vessels separated, it is obvious that is to demonstrate one step of the operation but that in order to have the blood running it is necessary to put them in close contact.

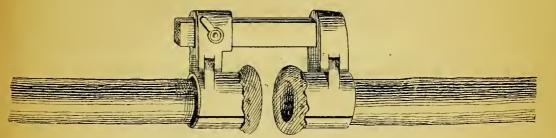


Fig. IV. — The two blood ressels are inverted over the hooks and ready to be put in contact.

As the passage of blood from the artery to the vein was accomplished so naturally and easily I though it possible to save the artery of the donor by anastomising the two segments. While the transfusion of blood is going on, the segment of artery wich is not used can be mounted over an other cilinder and later the continuity of the artery can be reestablished, in the same way as was done between artery and vein. It will be wise to squeeze a little the distal segment of the artery in order to get few drops of blood. I will beg your indulgence for the description of some experiments made for that purpose.

The carotid was used for the direct transfusion. I joined the two segments with my cilinders and closed the wound: the dog next day was found dead from hemorrhage. I though that the hooks, the screw etc., did irritate so much the tissues that by continually moving his neck the dog had caused the separation of the approximated ends of the artery.

I then put around the cylinders some rubber tissue and two days after the blood was running freely. I tried to take the cylinders away but I had so much bleeding that I tied the artery. During many others experiments I saw thad the blood was running freely as far as the thyrd day after the anastomosis had been made; I could not leave the instrument in place any longer without having hemorrhage, probably due to the fact that the dogs could not be kept still.

I tried to make a circular suture of the vessel while the cylinders were in place, but I could not succeed with the straigh needles and, on account of illness I had to stop my experiments.

The methods now used for direct transfusion can be reassumed in two the Carrel method and the Crile botton.

The Carrel method is certainly very good, and Carrel is a surgeon of great hability but it is so difficult to make an anastomosis with his method, that only surgeons with a special training will use it.

The Crile button is a very valuable device: but even without the probability of saving the artery; my instrument seems to have the following advantages.

As the blood vessels are not opened until the moment that they will be put in contact, the danger of hemorrhage are practically eliminated.

It is impossibile to introduce air in the circulation.

There is no probability of blood cloting, because it passes rapidly and directly from the vein to the artery.

The anastomosis with this method is the most rapid and easy.

It is easy to make a temporary anastomosis betwen blood vessels.

ETHER ANESTHESIA BY COMPRESSED AIR

The aim of this paper is not to discuss wich is the best general anesthetic. In America ether is preferred, while in Europe chloroform alone or associated with ether is generally used.

I think that the simple method wich I am presenting to you eliminates many of the inconveniences attributed to ether, and therefore will render its use more universal.

A common tank for compressed air is used: the tank has two opening

Our for compressed air.

Mask:

Walf bottle with ether.

Fig. 1. — Complete apparatus for ether anestesia.

Il s'agit d'utiliser un réservoir commun à air comprimé avec deux tubulures, une pour introduire l'air avec une pompe, l'autre pour le laisser

one to introduce the air by means of a pomp, the other to let it escape when desired. The tube wich allows the air to escape in connected with a Wolf bottle of good size. A Wolf bottle can be made by everyone; it is only necessary to have a bottle, a cork with two perforations and two glass tubes.

The tube wich will be in comunication with the compressed air, will be lowered to the bottom of the bottle, the other will trepass the cork about a centimeter and by mean of rubber tubing will comunicate with the mask. Fig. I. The mask is composed of a straight metal tube inserted over a metal dome resulting from the union of four diverging tubular branches perforated at the inner side and joined together by a flexous wire adapting

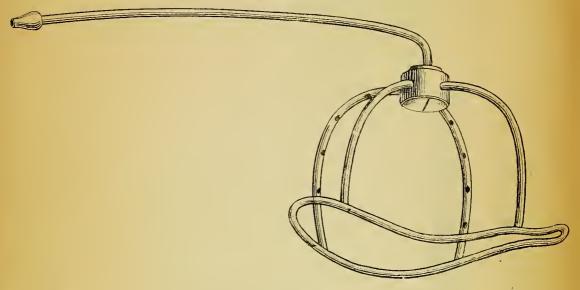


Fig. II. - Mask.

itself to the nose and mouth (Fig. II). The straight tube connecting the dome with the Wolf bottle is articulated and can be turned at any angle.

When I have to deal with children, women, or persons not given to alcohol, I begin the anaestesia in this way.

A tank containing oxygen is connected with the rubber tubing wich in Fig. I is seen secured with an artery forceps, betwen the tank of the compressed air and the Wo'f bottle. I let the oxygen pass through the ether and I put the mask uncovered over the patient's nose and mouth. The inhalation of ether and oxygen is not desagreable. I engage the patient in a conversation as lively as possible in order to make him breathe well. When in a few minutes he begins to loose consciousness, I stop the passage of oxygen: I allow the air to pass through the ether and I cover the mask with a towel. In few minutes the patient is completely anestetized.

To give ether in this way requires a longer time than with other methods but the patient takes the anestetic without showing any or very little signs of distress, loosing consciousness slowly but quietly.

When the patient is well under, the passage of air through the ether will be disminished, by turning the screw, and giving the amount necessary to maintain the anestesia.

When dealing with patient given to alcohol, or that for any other reason the anestesia is started with chloroform, ethyl chloride etc., once the patient under, the mask will be put covered over his mouth and nose and the necessary amount of air allowed to pass through the ether.

Fig. I. Shows a rubber tube secured by an artery forceps betwen the Wolf bottle and the mask: said tube will be used when it is though advisable to administer pure oxygen; it is only necessary to connect this rubber tube with the tank containing oxygen and easily without disturbing anything the patient will be given pure oxygen.

With the method just described the patient breaths only pure air and ether, and the their continous passage under the mask takes away all the impurities coming from respiration.

The must important result obtained by this method is that the patient gets the ether without interruptions and uniformally that is: he does not at moments receive too much ether and at moments too little as it happens with the other methods. And in fact by pouring ether over a mask, cone, or reservoir, the moment that the anestetic is poured, it will rapidly evaporate, the patient receiving a great amount of ether, until because of the evaporation very little is left, the patient receiving less anestetic; then again ether is poured and so on. I would express what I mean, by an interrupted line; the highest points of the diagram fig. III corresponding

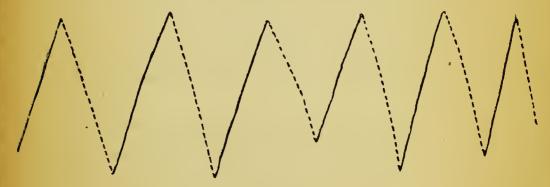


Fig. III.

to the moment that ether is administered, the lowest point representing the moment when the patient is receiving the least amount of anestetic. In this way the ether is given with ups and downs resulting in continous shocks while with the compressed air, the administration of ether is so continous that it could be represented by an horizontal line. The drop method seems to give the same results, but beside its difficulty, it has always the disadvantage that at moments the anestetist either, because he must clean the mouth of the patient, give an ipodermic injection, or for many others reasons, is compelled to administer more ether at one time, in order to keep the patient under while he is busy with someting outside of the administration of ether. Another advantage: the drop method depends on the individual ability of the anestetist, while the compressed air method work automatically and no special hability is required.

The following experiments show how safe the method is.

I covered with a metal cone surrounded and closed with gauze the mouth and nose of several dogs. The cone was connected with the bottle containing ether. I allowed an absolutely free passage of air during about 10 minutes: the dogs were well under in about two minutes, but I could not kill them. I put then in comunication with the same cone a bottle containing ether; the bottle was held in a basin containing warm water: the dogs of the same size as the ones used in the previous experiences used to die in from 4 to 5 minutes.

I explain in this way the different action of the ether.

The air passing through the ether causes its evaporation, wich produces an intense cold wich encreases with the more rapid evaporation. A coat of ice will be found round the bottle and probably the ether vapors are condensed, and so only a limited amount of ether reaches the mask. Probably the ether vapors when very cold do not irritate the mucosa of the respiratory tract, whilst certainly warm ether vapors cause oedema of the same mucosa and consequently death of the patient.

It is evident that if one can not intentionally kill a dog, it will be highly improbable that a person for whom much care is taken could die from ether anestesla given with the method described,

Beside being safe the method presents many other advantages.

When there are only two surgeons, or even only one, the anestesia can be carried out, I dare to say, automatically. The surgeon, or one of the two, will put under the patient; regulate the quantity of air wich has to pass through the ether; prepare his hands and the patient, and then cover the screw of the tank with a sterile towel. The anestesia will proceed without any help, but in case it should be necessary to encrease or disminish the amount of ether the surgeon will easily do it without much trouble. I have during my work on the intestine, operated all alone without any incoveniences. Anybody can, when necessary, regulate the screw following the orders given by the operator.

When operating on the head, neck and all the upper part of the body the surgeon and his assistants will not be embarassed by the body or hands of the anestetist: the latter can place himself anywhere. Every probability

of infecting the field of operation coming from the anestesia, will be avoided by boiling the mask and covering it with a sterile towel.

When the patient must be turned with his face downward or be put on one side, it will be sufficient to fix the mask in position with adhesive plaster, a strand of gauze etc. in order to give the ether as casily as in any plain case.

Often the patient are anestetized more easily than by other methods, some even escaping the excitation stage.

There is very little, if any, irritation to the air passages.

At the beginning of anestesia, the mask is open, thus avoiding the feeling of suffocation wich so many patients experience with a closed mask.

There is a minimum of ether inhaled by the patient, which is proven by the fact that as soon as the ether is stopped the patient becomes conscious.

If the patient needs oxygen, there is no trouble in administering it.

The patient receives only ether and pure air, and does not breathe any of the impurities coming from his own respiration, which in my belief is one of the most active cause of vomiting.

The anestetist has no trouble with the dropping of the anestetic, replacing and holding the mask, refilling bottles, etc., but can give his entire attention and help to the patient.

An account of this method has been published on the « Medical Record », December 19-1908.





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